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FISH & RICHARDSON, PC  
12390 EL CAMINO REAL  
SAN DIEGO, CA 92130-2081

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| EXAMINER |
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LEUNG, CHRISTINA Y

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| ART UNIT | PAPER NUMBER |
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2633

DATE MAILED: 03/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/839,693

Applicant(s)

WAY ET AL

Examiner

Christina Y. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 April 2001 and 03 December 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-35, 41-61 and 63 is/are allowed.
- 6) ☒ Claim(s) 1, 4-9, 11-14, 36, 38-40 and 62 is/are rejected.
- 7) ☒ Claim(s) 2, 3, 10 and 37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 13 August 2001.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 14 is objected to because of the following informalities:

Claim 14 recites "rejectba" (sic) in line 9 of the claim. Examiner respectfully suggests that Applicants change this word to "reject."

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5 and 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 11 each recite the limitation "the modulated optical carrier" in line 2 of the claims. Claim 12 recites the limitations "the interleaved single sideband modulator" in lines 1-2 of the claim. There is insufficient antecedent basis for these limitations in the claims, since the claims on which they depend do not specifically recite a modulated carrier (in the case of claims 5 and 11) or a interleaved single sideband modulator (in the case of claim 12). Claim 13 depends on claim 12 and is also indefinite for the above reason.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 36 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Brock et al. (US 5,781,327 A).

Regarding claim 36, Brock et al. disclose a method of modulating an optical carrier (Figures 3 and 4A-C), comprising:

receiving an output that includes an optical carrier and interleaved sideband signals (the optical amplifying medium 32 receives an optical carrier and sidebands as shown in Figure 4A);

separating the interleaved sideband signals from the optical carrier (circulator 34 and etalon 36 separate the sidebands from the carrier; column 4, lines 38-50); and

modulating the optical carrier to create a modulated optical carrier (using modulator 30, which receives the carrier transmitted through etalon 36 as shown in Figure 4B).

Examiner notes that the signal disclosed by Brock et al. contains multiple sidebands that are combined or "interleaved" in a same signal; the claim does not recite any details or specific limitations regarding interleaving.

Regarding claim 40, Brock et al. disclose a method of re-modulating or suppressing an optical carrier at a remote location in a network (Figures 3 and 4A-C), comprising:

receiving an output that includes an optical carrier and interleaved sideband signals (the optical amplifying medium 32 receives an optical carrier and sidebands as shown in Figure 4A);

separating the interleaved sideband signals from the optical carrier at a remote network site (circulator 34 and etalon 36 separate the sidebands from the carrier; column 4, lines 38-50); and

modulating the optical carrier to create a modulated optical carrier or notch out the optical carrier (using modulator 30, which receives the carrier transmitted through etalon 36 as shown in Figure 4B).

Brock et al. disclose that the method is used in an optical communication link/network (column 1, lines 5-13; column 3, lines 48-50). Although they do not specifically use the term "remote location" or "remote site," it would be well understood that the method disclosed by Brock et al. is performed at a transmitting site on one end of a communication link, i.e., at a site that is "remote" relative to the receiving site.

6. Claim 39 is rejected under 35 U.S.C. 102(b) as being anticipated by Frankel, M. Y. et al. ("Optical single-sideband suppressed-carrier modulator for wide-band signal processing," Journal of Lightwave Technology, vol. 16, no. 5, pp 859-863, May 1998).

Regarding claim 39, Frankel et al. disclose a method of re-inserting an optical carrier at a remote location in a network(Figure 1) comprising:

receiving an output that includes an interleaved sideband signals with a suppressed optical carrier ("SSB-SC output" is produced by the suppressed carrier modulator and received at a coupler);

combining an optical carrier (from the local oscillator laser) with the same wavelength as the suppressed optical carrier and the interleaved sideband signals at a remote network site (combined using the coupler).

Frankel et al. specifically disclose using the local oscillator to produce an optical carrier with the same wavelength as the suppressed carrier of the other signal (on page 862, left column,

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second paragraph, they disclose "using an optical LO tuned to the same frequency as the original optical carrier....").

Examiner notes that the signal disclosed by Frankel et al. contains signals that are combined or "interleaved" in a same signal; the claim does not recite any details or specific limitations regarding interleaving.

Although Frankel et al. do not specifically use the term "remote location" or "remote site," it would be well understood that the method disclosed by Frankel et al. is performed at a transmitting site on one end of a communication link, i.e., at a site that is "remote" relative to the receiving site.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 6-9, 14, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olshansky (US 5,239,401 A) in view of Calvani et al. (US 5,479,082 A).

Regarding claims 1, 6-9, and 14, Olshansky discloses an output that includes an optical carrier and interleaved optical single sideband signals. Figure 12 shows a signal with a carrier  $f_0$ , and single sideband signals USB1, USB2, and USB3). Examiner notes that the single sideband signals taught by Olshansky are "interleaved" together in the sense that they are multiplexed/combined together onto a same signal. The claim does not specifically recite any further details regarding the interleaving. Olshansky further discloses a filter 262 (Figure 15) for

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separating desired parts of this output signal from the rest of the signal but does not specifically disclose an optical coupler with three ports coupled to a filter as recited.

However, Calvani et al. teach an optical notch filter (Figure 2) comprising:

an optical coupler comprising a multi-port circulator C1 including at least a first, a second, and a third port, the first port P1 being configured to receive an output that includes an optical carrier and other optical frequencies;

an optical bandpass/narrowband reject filter FP coupled to a port P3 of the optical coupler, the optical bandpass filter separating the output into a transmitted signal that contains the all frequencies except for the reflected frequencies and a reflected signal that includes the reflected frequencies reflected from the optical bandpass filter to the third port (the port labeled "P2" in Figure 2) of the optical coupler/circulator (column 4, lines 1-18).

Regarding claim 6 in particular, Calvani et al. further teach that the bandpass filter FP is centered at the same wavelength as the transmitted signal (column 3, lines 52-55).

As Olshanski further discloses in Figure 12, carrier signals and single sideband signals are distinguishable from each other by frequency. Regarding claims 1, 6-9, and 14, it would have been obvious to a person of ordinary skill in the art to use the coupler and filter elements taught by Calvani et al. to filter the optical carrier and interleaved single sideband signals taught by Olshansky as a particular way to extract desired components of the signal that uses components that are more available and have greater selectivity than other elements (Calvani et al. column 2, lines 22-26).

Regarding claim 62, Olshansky discloses that frequencies and power of the sidebands are adjustable (column 5, lines 52-60; column 11, lines 41-60).

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9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olshansky in view of Calvani et al. as applied to claim 1 above, and further in view of Chraplyvy et al. (US 5,546,210 A).

Regarding claim 4, Olshansky in view of Calvani et al. describe a filter as discussed above with regard to claim 1 including optical single sideband signals, but they do not specifically disclose that the single sideband signals have unequal channel spacings.

However, Chraplyvy et al. teach a system related to the one described by Olshansky in view of Calvani et al. including a signal comprising signal components or channels combined together (Figure 1). Chraplyvy et al. further teach spacing the channels unequally (column 2, lines 28-55)

It would have been obvious to a person of ordinary skill in the art to use unequal channel spacings as taught by Chraplyvy et al. in the optical single sideband signals of the system described by Olshansky in view of Calvani et al. in order to reduce negative effects caused by four wave mixing in the transmitted signal and thereby better transmit multiple channels (Chraplyvy et al., column 2, lines 28-55).

10. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brock et al.

Regarding claim 38, Brock et al. disclose a method as discussed above with regard to claim 36, but they do not specifically disclose that the frequencies of the interleaved sideband signals are offset from the ITU grid. However, it is well understood in the art that modulators such as the modulator 30 disclosed by Brock et al. produce sidebands at some frequency that is not necessarily on the ITU grid. It would have been obvious to a person of ordinary skill in the art to use interleaved sideband signals with frequencies offset from the ITU grid in the method



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disclosed by Brock et al. in order to transmit signals having the particular frequency desired by the receiving end even when that frequency is not on the ITU grid so that the signals may be properly extracted and received.

*Allowable Subject Matter*

11. Claims 15-35, 41-61, and 63 are allowed.
12. Claims 2, 3, 10, and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
13. Claims 5 and 11-13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
14. The following is an examiner's statement of reasons for allowance:

Jopson (US 5,745,273 A) and Olshansky (US 5,301,058 A) both suggest an optical single sideband transmission system (Jopson, Figures 1 and 2A-D; Olshansky, Figure 5a) including an optical carrier signal split into two signals and first and second electrical signals which modulate the optical signals.

Sieben et al. (US 5,880,870 A) also suggest an optical single sideband transmission system including first and second electrical signals phase shifted 90 degrees relative to each other which modulate an optical carrier signal split into two signals (Figure 2).

However, neither Jopson, Olshansky, nor Sieben et al. disclose or suggest a system specifically including the elements recited by claim 1 and particularly including a combination of first and second AC phase modulators and first and second DC phase modulators as recited and a

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combiner which combines the modulated first and second optical signals to form a combined optical signal having an optical carrier component, such that alternate channels of the combined optical signal are substantially cancelled.

They also do not disclose or suggest a method specifically including the steps recited in claim 13 and particularly including a first and second split signal corresponding to a plurality of electrical signals and producing an optical signal such that alternate channels are substantially cancelled and residual images of upper side band channels do not substantially overlap channels carried on a lower side band..

#### *Conclusion*

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023.

The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y Leung  
Christina Y Leung  
Patent Examiner  
Art Unit 2633